



# Southern Forest Health Research and Management Update



Fall 2016

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**This newsletter is a  
joint publication of:**

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## Science and Program Highlights

### Studying the impacts of prescribed fire on forest pollinator communities

To better understand how prescribed fire affects pollinators in southern pine forests, SRS-4552 entomologists **Michael Ulyshen** and **Scott Horn** are working with collaborators at Piedmont National Wildlife Refuge (central Georgia) and UGA (including entomology PhD student **Conor Fair**) to investigate how the abundance and richness of bees and butterflies change with distance into burned stands. Colored pan traps were established every 50 m along 500 m transects into burn blocks to determine whether pollinator numbers change with distance from unburned habitats. The second year of sampling was completed this year and Conor (see figure) presented some preliminary findings at the International Congress of Entomology for which he was awarded first place in the student competition. The findings from this study will provide important insights into how burn size may affect pollinator communities. For more information, please contact Michael Ulyshen ([mulyshen@fs.fed.us](mailto:mulyshen@fs.fed.us)).



*Univ. of Georgia doctoral student Conor Fair with his pollinator collection*

### Laurel wilt disease transmitted by non-native beetle found in Arkansas

Laurel wilt is a lethal disease of many plants including avocado, redbay, and sassafras. The disease is caused by a fungus carried by an exotic ambrosia beetle that was introduced into the U.S. by 2002. Laurel wilt has spread rapidly across the southeastern states causing extensive mortality, primarily in redbay. In December 2015, **Rabiu Olatinwo** and **Stephen Fraedrich** (SRS 4552) and cooperators **Chandler Barton** (Arkansas Forestry Commission), **Wood Johnson** and **Jaesoon Hwang** (FHP Region 8) identified and confirmed the first report of laurel wilt on sassafras in Arkansas, following mortality of several sassafras trees in Bradley County near Warren, Arkansas.

## Laurel wilt disease (continued)

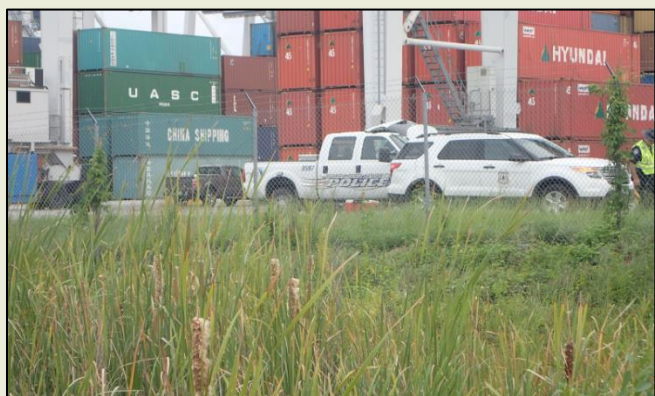
This discovery of laurel wilt in Arkansas, as recently published in the journal *Plant Disease*, further documents the northward spread of the disease in forest types with sassafras that are beyond the native range of redbay as observed in other states. Although laurel wilt was reported on sassafras in northern Louisiana about 134 km southwest of the site in Arkansas several months earlier, the new discovery in Arkansas represents another major “jump” in the distribution of the disease. Laurel wilt continues to spread in areas where redbay is absent.

For more information, please contact Rabiw Olatinwo at [rolatinwo@fs.fed.us](mailto:rolatinwo@fs.fed.us).



*Dead branches on a sassafras tree with laurel wilt (left). Dark sapwood discoloration characteristic of the disease on sassafras (right).*

## Federal noxious weed prevention survey now in its second season



Economic and environmental consequences of non-native invasive plants continues to rise, especially in the Southern region, which is home to a large number of seaports. In an effort to prevent the introduction of new species and additional propagules of already established invasive plants, SRS 4552 established a multi-agency project to quantify and estimate propagule pressure on incoming shipping containers associated with agricultural commodities entering the country. This project at the Port of Savannah includes cooperators at Arkansas State University (ASU) and

Columbus State University (CSU) to identify and voucher collections, as well as develop DNA barcodes for these cryptic hitchhikers.

We recently welcomed two new cooperators to the project through ASU: **Dr. Chelsea Cunard** is our Post-doctoral Research Associate, developing mathematical probabilities based on the data generated thus far, and **Jarron Gravesande**, an enrolled University of Georgia undergraduate pursuing a B.S. in Biological Sciences, is assisting with quantification and germination trials. We anticipate completion of baseline field surveys in early 2017 along with the associated DNA barcodes. We continue to work closely with US Customs and Border Protection (DHS) and the Georgia Ports Authority, in efforts to develop effective preventative measures of Federal Noxious Weeds and to intercept other potential non-native invaders into Southern forestlands. For more information please contact Rima Lucardi ([rlucardi@fs.fed.us](mailto:rlucardi@fs.fed.us)).



*Dr. Chelsea Cunard (left) and Jarron Gravesande (right).*

## Forest Service and Smokey Bear charm kids and adults at the International Congress of Entomology “Insect Expo”

The 25th International Congress of Entomology (ICE) was recently held in Orlando, Florida, with over 6,000 participants from around the world. As part of the convention, various organizations gathered together to present an Insect Expo to over 2,000 area children in Orlando. SRS 4552 hosted an interactive “Forest’s Most Wanted” booth which incorporated popular live insects, such as Madagascar hissing cockroaches and bess beetles, and photos and pinned insects of the emerald ash borer, redbay ambrosia beetle, southern pine beetle, Asian longhorned beetle, and many more forest pests. Insect and leaf stencils provided a fun hands-on activity for the participants. Smokey Bear high-fived and fist-bumped his way through the crowds, meeting many international scientists and local elementary students. Many thanks to the volunteers who assisted with the Forest Service station: **Stacy Blomquist** (SRS/Kisatchie National Forest), **Bobbe Fitzgibbon** (retired FHP), **Richard Reardon** (FHP), **Vanessa Lopez** (FHP), and several graduate student volunteers.



*Some of the the “Insect Expo” Forest Service Team at ICE, from left to right: Angie Beltran (University of Florida), Matthew Thorn (Mississippi State University), Bobbe Fitzgibbon (FHP), Richard Reardon (FHP), Matan Shelomi (Max Planck Institute, Germany), and Riley Lovejoy (University of Alabama).*

*Bobbe Fitzgibbon shares information with participants at the ICE Insect Expo.*



## Symposium on “Arthropods and Decomposition” at ICE 2016

Together with **Dr. Jen Pechal** at Michigan State University, **Michael Ulyshen** (SRS-4552) co-organized a symposium on “Arthropods and Decomposition” at the International Congress of Entomology in September. Fifteen speakers from six countries participated and discussed the role of arthropods in the decomposition of a wide range of substrates (including plant and animal remains) in both terrestrial and aquatic systems. For his presentation, Ulyshen summarized his work on “Patterns and implications of insect-accelerated wood loss in southeastern U.S. forests”. For more information, please contact Michael Ulyshen ([mulyshen@fs.fed.us](mailto:mulyshen@fs.fed.us))



*Participants in the Arthropods and Decomposition Symposium at ICE 2016.*

## In The News

### Goodbye to Sue Moore and DeColar Terrell

SRS-4552 extends our warm goodbye to **Sue Moore** and **DeColar Terrell**, who have been working for the unit on administrative contracts since 2011. They will be dearly missed!



**Sue Moore** started her career in December 1978 as the receptionist with Kisatchie NF, working also in the “typing pool” (can’t you just hear the young folks saying, “where..?”). She left the FS briefly in 1981 to attend Delta Junior College Diesel Academy in Greenville, MS and worked as cross-country truck driver until returning to the Kisatchie in late 1982. She worked for Southern Research Station 1984 – 1997 and as Forest Supervisor’s Secretary 1997 – 2007. She then got a promotion to Recreation taking inventory at recreation sites and inputting INFRA data. The Forest Service offered an early-out retirement in 2011 and she took the offer with 32 years of service. In September 2012, Sue was hired on a contract as a part-time administrative assistant and she felt like she was home again, having worked many years ago in the unit as secretary. The timing now is perfect for her departure since full retirement took effect this past July. Sue says many thanks to everyone for making her work in 4552 so enjoyable!

**DeColar Terrell** began her career with the USDA Forest Service on September 1, 1974. She remained in the same unit, SRS 4552 Insects, Diseases and Invasive Plants until her retirement January 5, 2013. During this tenure, there were eight Project Leaders – Harry Powers, George Kuhlman, Paula Spaine, Kerry Britton, James Hanula, Kier Klepzig, Doug Street and Bud Mayfield. DeColar returned to the Unit part-time under contract in April 2013 and plans to end this tenure December 9, 2016. She says it has been a great success and a wonderful journey.



# Technology Transfer

## Publications (in print/press):

1. Fraedrich, S.W., T.C. Harrington, B.A. McDaniel, and G.S. Best. 2016. **First report of laurel wilt, caused by *Raffaelea lauricola*, on spicebush (*Lindera benzoin* (L.) Blume) in South Carolina.** Plant Disease (in press).
2. Handoo, Z. A., L. K. Carta, A. M. Skantar, S. A. Subbotin, and S. W. Fraedrich. 2016. **Molecular and morphological characterization of *Xiphinema chambersi* population from live oak in Jekyll Island, Georgia with comments on morphometric variations.** Journal of Nematology 48(1): 20-27.
3. Hanula, J.L., M.D. Ulyshen, and S. Horn. 2016. **Pollinator-friendly best management practices for North American pollinators: Thinning, understory shrub control, and removing invasive species.** Natural Areas Journal (in press).
4. Mudder, B. 2016. **First release in the Carolinas of new hemlock woolly adelgid predator.** CompassLive, Southern Research Station, January 13, 2016, and published on SRS website August 25, 2016.
5. Shepherd, W. P, Sullivan, B.T., Mayfield III, A.E., and McDonald, R.C. 2016. **Olfactory Responses of the Hemlock Woolly Adelgid Predator, *Laricobius nigrinus* (Coleoptera: Derodontidae), to Natural and Synthetic Conifer Volatiles.** J. of Entom. Science 51: 29-42.
6. Sullivan, Brian T., Cavell Brownie, and JoAnne P. Barrett. 2016. **Intra-Annual variation in responses by flying southern pine beetles (coleopteran: Curculionidae: Scolytinae) to pheromone component *endo*-Brevicommin.** J. of Econ. Entom.: 1-9. Doi: 10.1093/jee/tow078.
7. Ulyshen, M.D. 2016. **Wood decomposition as influenced by invertebrates.** Biological Reviews 91(1): 70-85.
8. Ulyshen, M.D., S.V. Diehl, and D. Jeremic. 2016. **Termites and flooding affect microbial communities in decomposing wood.** International Biodeterioration & Biodegradation 115: 83-89.

## Submitted Publications (in review):

1. Aubrey, Doug P., S.W. Fraedrich, T.C. Harrington, and R. Olatinwo. **First record of *Cristulariella moricola* associated with foliar blight of Camden white gum (*Eucalyptus benthamii*), a bioenergy crop.** Biomass and Bioenergy (in review).
2. Audley, J., Klingeman, W., Mayfield, A., Myers, S., Taylor, A. ***Pityophthorus juglandis* (Coleoptera: Curculionidae: Scolytinae) colonization of *Juglans nigra* nursery trees.** Agricultural and Forest Entomology (in review).
3. Brantley, S.T., A.E. Mayfield III, R.M. Jetton, C.F. Miniati, D.R. Zietlow, C. Brown, and J.R. Rhea. **Elevated light levels reduce hemlock woolly adelgid infestation and improve carbon balance in eastern hemlock seedlings.** Forest Ecology and Management (in review).
4. Elkinton, J.S., Lombardo, J.A., Roehrig, A.D., McAvoy, T.J., Mayfield, A., and Whitmore, M. **Induction of cold-hardiness in an invasive herbivore: the case of the hemlock woolly adelgid (Hemiptera: Adelgidae).** Environmental Entomology (in review).
5. Seibold, S., C. Bassier, P. Baldrian, L. Reinhard, S. Thorn, M. Ulyshen, I. Weiss, and J. Muller. **Species groups of non-saproxyllic epigeal taxa respond differently to dead-wood addition and canopy openness.** Biological Conservation (in review).
6. Wiggins, G.J., J.F. Grant, J.R. Rhea, A.E. Mayfield, A. Hakeem, P.L. Lambdin, and A.L. Galloway. **Trapping methods to assess emergence, populations, and hybridization of *Laricobius nigrinus*, an introduced predator of hemlock woolly adelgid, in the Southern Appalachians.** Environmental Entomology (in review).

## Presentations and Lectures:

1. Best, G.S. and S.W. Fraedrich. 2016. **The impact of laurel wilt caused by *Raffaelea lauricola* on clonal populations of pondberry (*Lindera melissifolia*)**. American Phytopathological Society Meeting, Tampa, FL 30 July – 3 August 2016 (poster).
2. Blomquist, Stacy R. 2016. **The remarkable career of John Moser**. International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation).
3. Fair, C., M.D. Ulyshen, J. McHugh, and S. Horn. 2016. **Impacts of prescribed fires on forest pollinator communities: implications for burn size**. International Congress of Entomology, Orlando, FL, September 25-30, 2016 (poster).
4. Fraedrich, Stephen W. 2016. ***Raffaelea* species associated with *Xyleborus glabratus* with particular emphasis on *R. lauricola*, the cause of laurel wilt**. International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation).
5. Gandhi, K.J.K., J.C. Staeben, D.R. Miller, J.T. Nowak. **Multi-trophic semiochemical interactions within the pine beetle guild in the southern U.S.** 2016 XXV International Congress of Entomology, September 25 – 30, 2016, Orlando, FL (invited presentation).
6. Heminger, Ariel, Albert Mayfield, Gregory J. Wiggins, Jerome F. Grant, Joseph Elkinton, Thomas McAvoy, Andrew Tait, Scott Salom. 2016. **Impact assessment of *Laricobius nigrinus* (Coleoptera: Derodontidae), a predator of hemlock woolly adelgid, *Adelges tsugae* (Hemiptera: Adelgidae)**. International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation). Doi: 10.1603/ICE.2016.111052.
7. Horn, S., J. Hanula, J. Hudson, M. Ulyshen, and Y.Z. Zhang. **Pollinator recovery after privet control** - Atlanta Botanical Gardens: Science Café. September 11th, 2016. (Invited Oral Presentation)
8. Hwang, Jaesoon. 2016. **Sudden Oak Death: A Southeastern Perspective**. Department of Plant Pathology and Crop Physiology, Louisiana State University, Baton Rouge, LA, September 2016 (invited speaker).
9. Klepzig, Kier D., Brian L. Strom, and John T. Nowak. 2016. **Time to stop studying them and start killing them? Tree killing bark beetles and modern forest management**. International Congress of Entomology, Orlando, FL, September 25-30, 2016 (presentation).
10. Lucardi, R.D., K.S. Burgess, C.E. Cunard, T.D. Marsico, L. Whitehurst, S.J. Worthy. 2016. **Barbarians at the gates: The federal noxious weed prevention survey at the Port of Savannah” in plain sight – 2016 (19<sup>th</sup>) Joint Annual Conference of the South Carolina and Southeast Exotic Pest Plant Councils (SC-EPPC and SE-EPPC)**. September 2016, Bluffton-Sun City, SC (presentation).
11. Mangini, Alex and Stacy R. Blomquist. 2016. **Don’t let it slide – curating the John C. Moser mite collection**. International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation).
12. Nino-Dominguez, Alicia, Brian T. Sullivan, Jorge Macias-Samano, and Stephen R. Clarke. 2016. **Coexistence of two aggressive species of pine bark beetle, *Dendroctonus frontalis* and *D. mesoamericanus* in Chiapas, Mexico: interactions and their influence on host colonization**. International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation).
13. Olatinwo, R. Barton, C. Johnson, W. and J Hwang, 2016. **First report of laurel wilt on sassafras in Arkansas**. The 2016 Annual Meeting of the American Phytopathological Society. Tampa Florida, July 30 - August 3, 2016. (Poster). <http://www.apsnet.org/meetings/annual/abstracts/pages/abstractdetail.aspx?MID=795>
14. Olatinwo, R. and S. W. Fraedrich. **Acaromyces ingoldii inhibits the laurel wilt pathogen, *Raffaelea lauricola* in vitro**. The 2016 Annual Meeting of the American Phytopathological Society. Tampa Florida, July 30 - August 3, 2016. (Poster). <http://www.apsnet.org/meetings/annual/abstracts/pages/abstractdetail.aspx?MID=396>
15. Olatinwo, Rabi, Steven M. Walters, and Brian L. Strom. 2016. **The effect of *Beauveria bassiana* formulation on *Ips avulsus* and *Dendroctonus frontalis* bark beetles in a loblolly pine bolt assay**. International Congress of Entomology, September 25-30, 2016, Orlando, FL (poster).
16. Salom, Scott, Kenton L. Sumper, Ariel Heminger, Molly N. Darr, Albert E. Mayfield, Jerome F. Grant, Joseph S. Elkinton, Thomas McAvoy, Andy Roberts. **What do you want to hear first: the good news or the bad news about**

- biological control of hemlock woolly adelgid, *Adelges tsugae* (Hemiptera: Adelgidae)?** International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation). Doi: 10.1603/ICE.2016.94672.
17. Stoklosa, Allison and Michael D. Ulyshen. 2016. **The role of insects in fine woody debris decomposition.** International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation).
18. Strom, Brian L., Sheri L. Smith, Harold W. Thistle, James R. Meeker, and Jeremy D. Allison. 2016. **Habitat heterogeneity and behavior of forest Coleoptera: implications for monitoring and management.** International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation).
19. Sullivan, Brian T., Alicia Nino-Dominguez, Amanda Grady, Richard W. Hofstetter, and Deepa S. Pureswaran. 2016. **Why is there so much variation among semiochemical systems of aggressive bark beetles?** International Congress of Entomology, September 25-30, 2016, Orlando, FL (presentation).
20. Sumpter, K., S. Salom, B. Carlyle, A. Mayfield III, T. Anderson, T. McAvoy. 2015. **Evaluating a Potential Area-wide IPM Strategy for Managing Hemlock Woolly Adelgid in the eastern United States.** International Congress of Entomology, September 25-30, 2016, Orlando, FL. Doi: 1603/ICE.2016.112597 (presentation).
21. Ulyshen, M.D., S. Seibold, M. Strickland, A. Stoklosa, and S. Horn. **Patterns and implications of insect-accelerated wood loss in southeastern U.S. forests.** International Congress of Entomology, Orlando, FL, September 25-30, 2016 (oral presentation).
22. Whitehurst, L., K. Burgess, S. Worthy, T. Marsico, R. Lucardi. 2016. **Implementing a DNA barcoding pipeline for the identification and prevention of invasive plant propagules entering ports.** Botany 2016: Botanical Society of America, July 2016, Savannah, GA (Poster).



USDA Forest Service

Forest Health Protection, Southern Region:  
<http://www.fs.usda.gov/main/r8/forest-grasslandhealth>

Southern Research Station  
RWU 4552: Insects, Diseases and Invasive Plants of Southern Forests:  
<http://www.srs.fs.usda.gov/idip/index.html>